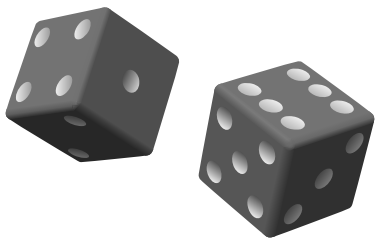

This test has 5 pages.
Please make sure you have them all
right now and just before you turn it in.

There are 25 points total
distributed over 4 problems.

This test is closed books and closed notes.

You will need a calculator and a copy of statistical tables.

When working with numbers,
you may round to 4 digits after the decimal point,
e.g. $3.1415926 \approx 3.1416$.

MA 113 B2 TEST 1

July 13, 2009. Student Name (Last, First) _____

BU ID # _____

Show all your work for full credit.

1. (5 points) Find sample statistics for the following data:

2 10 7 5 9 6 5 4

(1 point) Sample mean

(1 point) Sample standard deviation

(1 point) Sample variance

(1 point) Sample median

(1 point) Sample quartiles

2. (8 points) The catalog of the Booktastic Bus is summarized in the following table:

Binding \ Genre	Children's Fiction	Steamy Romance Novel	Non-fiction	
Hardcover	190	0	38	
Paperback	266	209	95	

(2 points) Find the probability that a random book from this collection is a fiction book.

(2 points) Find the probability that a random book is a non-fiction paperback.

(2 points) Find the probability that a random pick is children's fiction, given that it is a paperback.

(1 point) Are events "non-fiction" and "paperback" independent? Justify your answer.

(1 point) Are events "steamy romance novel" and "hardcover" mutually exclusive?

3. (6 points) According to Wikipedia, approximately 10% of Los Angeles population were African American in 2007. Suppose that a random sample of 12 people is chosen out of this population to act as a jury in a police brutality case.

(2 points) What is the probability that none of the members of the jury are African American?

(2 points) What is the probability that more than 2 members of the jury are African American?

(2 points) The same source informs us that about 0.8% (or 0.008) of the LA population were Native American. How likely is it that at least one member of the jury is Native American?

4. (6 points) Suppose that the length of a Summer blockbuster movie is approximately normally distributed with mean $\mu = 80$ minutes and standard deviation $\sigma = 20$ minutes.

(2 points) Find the probability that a randomly chosen movie is more than two hours long.

(2 points) Find the probability that a randomly chosen movie is between 60 and 90 minutes.

(2 points) What is the 95-th percentile of the movie length? (In other words, find x such that 95% of all movies are below x minutes in length.)

References

The picture of dice on the cover is by Stephen Silver.
It was put into the public domain by the author.

LA data came from http://en.wikipedia.org/wiki/Los_angeles

Movies data is inspired by an exciting analysis of 174,934 movie records by Larsson Omberg,
http://www.larssono.com/musings/movie_lengths/index.html
The raw data is from http://www.imdb.com